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ABSTRACT

Systemic planning is an operational approach to using scientific rigor and qualitative judgment in a complementary manner. It integrates rigorous techniques and methods from systems analysis, cybernetics, decision theory, and work programing. The annotated reference sources in this bibliography include those works that have been most influential in the development of the theory of systemic planning. Other references provide a general guide to the literature of systems analysis, cybernetics, decision theory, and work programing for persons interested in pursuing the most important readings in these areas. (Author/WM)

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SYSTEMIC PLANNING
An Annotated Bibliography and Literature Guide

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SYSTEMIC PLANNING:
An Annotated Bibliography
and
Literature Guide

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PREFACE

Over the last few years, the author, in collaboration with Dr. Alan Walter Steiss, has formulated the theory of Systemic Planning. Systemic Planning is a theory of integrating rigorous techniques and methods from Systems Analysis, Cybernetics, Decision Theory, and Work Programming with judgemental and qualitative planning practices. This hybrid theory is an operational approach to using scientific rigor and qualitative judgement in a complimentary manner. The first list of readings are the principal works of the author and collaborator in this development.

The author has been influenced by a number of key readings from the fields of Systems Analysis, Cybernetics, Decision Theory, and Work Programming. The annotated reference sources that are presented are those works which have been most influential in the development of the theory of Systemic Planning. They also provide a general guide to the literature of these various fields if one is interested in pursuing the most important readings rather than a voluminous literature search. Those interested in Systemic Planning will find the annotated references useful in further development of the theory as well as understanding more fully the influences in the theory from other fields.

The annotated reference sources often cover one or more of the fields mentioned above. As a further aid to the reader, however, an alphabetical code is listed with each reading to show the predominant field from which the reading has been selected. The code used is:

SA = Systems Analysis
DT = Decision Theory
CY = Cybernetics
WP = Work Programming

READINGS ON SYSTEMIC PLANNING

Catanese, Anthony James. "Urban Systems Planning: Retrospect and Prospect," High Speed Group Transportation Journal, Vol. III, No. 1 (January, 1969).

_____. "Planning: A Rearguard View -- Rejoinder," Journal of the Town Planning Institute, Vol. 54, No. 5 (May, 1968).

_____. "Automation in Planning: Some Perspectives on United States Experience," Plan: Journal of the Town Planning Institute of Canada, Vol. 9, No. 1 (March, 1968).

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_____. "A Systems Approach to Recreation Planning," The Recreation Element of the General Plan Revision Program: State of Hawaii. Honolulu: Donald Wolbrink & Associates, Inc., 1967.

_____. "Automation of Town Planning: Problems and Potentials of the Coming Revolution," Journal of the Town Planning Institute, Vol. 53, No. 10 (December, 1967).

_____. Data Processing for State Planning. Madison: Wisconsin Department of Resource Development, 1967.

_____. "Improving the Factual Base of Planning," Wisconsin Department of Resource Development Newsletter. November-December, 1966.

Catanese, Anthony James and Alan Walter Steiss. "The Search for a Systems Approach to the Planning of Very Complex Systems," Plan: Journal of the Town Planning Institute of Canada, Vol. 55, No. 1 (April, 1969).

_____. "Systemic Planning for Very Complex Systems," Planning Outlook, Vol. 5, No. 1 (Fall, 1968).

_____. "Systemic Planning," Ekistics, Vol. 26, No. 11, (August, 1968).

_____. "Systemic Planning: The Challenge of the New Generation of Planners," Journal of the Town Planning Institute, Vol. 54, No. 4 (April, 1968).

_____. "Programming for Governmental Operations: The Critical Path Approach," Public Administration Review, Vol. XXVIII (March/April, 1968).

_____. "An Actions Programmes Model for Governmental Comprehensive Planning," Annals of Public and Co-Operative Economy, Vol. XXXVIII, No. 3 (September, 1967).

_____. "Modell eines Aktionsprogramms für umfassende staatliche Planung," Annalen der Geminwirtschaft, Jahrang 36, Haft 3 (Juli, 1967).

_____. "Modèlle de Programmes D'Action Pour Une Planification. Gouvernmentale Générale," Les Annales de L'Economie Collective, 55e, Numero 3 (Juillet, 1967).

_____. "The Next Generation of Planners," Journal of Housing. Vol. 23, No. 11 (December, 1966).

Catanese, Anthony James, and Richard G. Poirier, Planning for Recreation: A Methodology for Functional Planning. Honolulu: Department of Planning and Economic Development, 1968.

Steiss, Alan Walter, and James Dickey, "The Use of Programming Models in Systemic Planning," High Speed Ground Transportation Journal, Vol. III, No. 1 (January, 1969).

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ANNOTATED REFERENCE SOURCES

Abendroth, W. V. "The Research and Decision-Making Process," In Jesse Shera, et. al. Documentation in Action. New York: Reinhold, 1956.
The author asserts that decision-making can be made into a science if the steps outlined as "Decision Calculus" are followed and if research techniques are used to reduce the area of projection based on insufficient data. DT

Ackoff, Russell L. "The Development of Operations Research as a Science," Operations Research, (June, 1956).
A bibliographic summary covering organization, decision theory, inventory theory, allocation process, queuing theory, routing process, replacement process, information-collection process, and competitive models. SA

_____. Scientific Method: Optimizing Applied Research Decisions. New York: John Wiley, 1962.
The author's major work in the field of Scientific Method. A textbook covering the rudiments, principles, and concepts of the Scientific Method. SA

Andlinger, Gerhard, et. al. Operations Research: Challenge to Modern Management. Cambridge: Harvard University, Graduate School of Business Administration, 1956.
The past uses and successes of operations research are investigated and the future of this aid to decision-making is forecast. SA

Anon. "Performance Design," Progressive Architecture, (August, 1967).
A concerned analysis of System Analysis by the architecture profession, seeking its meaning, as well as possible applications, for urban design. SA

Antill, James M., and Ronald W. Woodhead. Critical Path Methods in Construction Practice. New York: John Wiley, 1956.
A well-written introduction to CPM drawing upon the experience of the authors in Australian construction programs. WP

Archibald, Russell D., and Richard L. Villaria. Network Based Management Systems. New York: John Wiley, 1966.
An advanced treatment of network planning with special emphasis on the CPM technique, all within the perspectives of information science and systems. WP

Ashby, W. Ross. An Introduction to Cybernetics. New York: John Wiley, 1963.
A basic primer in the mathematics of Cybernetics. Extensive development of the concept of feedback and its application to complex, stochastic systems. CY

Associated General Contractors of America. CPM in Construction: A Manual for General Construction. Washington: Associated General Contractors of America, 1965.
Another treatment of the use of CPM in building and construction, but written in a... ea... to understand manner. WP

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Baker, Bruce N., and René L. Eries. An Introduction to PERT/CPM. Homewood: R. D. Irwin, 1964.
A widely used textbook with emphasis on the engineering and management of industrial organizations. WP

Baker, Robert F. "A Practical View of the Systems Approach," Traffic Quarterly, (October, 1967).
A discussion of how the United States Bureau of Public Roads is using systems approaches for research and development. The outputs are a series of technological innovations for traffic control. SA

Battersby, Albert. Network Analysis for Planning and Scheduling. New York: St. Martin's Press, 1964.
A descriptive textbook with several problems and solutions written by a highly lucid and literate Englishman. WP

Bertalanffy, Ludwig. "General Systems Theory," Main Currents in Modern Thought, (1955).
A basic treatise on the concept of General Systems Theory, with particular emphasis on the distinctions between open and closed systems, the concept of equifinality, and the importance of organization as a counterforce to entropy. SA

Bock, Robert H., and William K. Holstein. Production Planning and Control. Columbus: C. E. Merrill Books, 1963.
Chapters 6 and 7 are concerned with CPM and Heuristic Programming. In general, the work is a basic treatment of the general planning problem for industrial management. WP

Boguslaw, Robert. The New Utopians: A Study of System and Social Change. Englewood Cliffs: Prentice-Hall, 1965.
The author visualizes Systems Analysts as the new, "non-people" Utopians. Reviews basic constructs of Systems Analysis and concludes with a discussion of the role of systems in society. Distinctive because of its fine literary style. SA

Braybrooke, David, and Charles E. Lindblom. A Strategy of Decision: Policy Evaluation as a Social Process. New York: The Free Press of Glencoe, 1963.
An elaborate development of the concepts of "disjointed incrementalism" and "partisan mutual adjustment" as the prevailing form of decision-making. The authors challenge the synoptic or comprehensive form of problem-solving on the basis that it does not exist in reality. DT

Buchan, Joseph, and Ernest Koenigsburg. Scientific Inventory Management. Englewood Cliffs: New Jersey, Prentice-Hall, Inc., 1963.
Several examples are presented in this work of the use of computerized systems containing both analytical and heuristic elements for the purposes of inventory control. SA

Buckley, Walter. Sociology and Modern Systems Theory. Englewood Cliffs: Prentice-Hall, 1967.
A re-evaluation of classical and contemporary social theory within the perspective of a systems approach. The author is concerned with the lack of a theoretical framework in contrast to the growth of empirical data in social sciences. SA

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Calhoun, S. Reed, and Paul E. Green. "Simulation: Versatile Aid to Decision-Making," Advanced Management, (April, 1958).
A basic discussion of the application of simulation modelling techniques as a tool for problem-solving in organization decision-making situations. DT

Carr, Charles R., and Charles W. Howe. Quantitative Decision Procedures in Management and Economics. New York: McGraw-Hill, 1964.
An outstanding textbook on deterministic theory and applications. Includes discussions of mathematical model building, set theory, linear programming, quadratic programming, stepwise optimization, and Markovian processes. SA

Cartwright, Dorwin, and Leon Festinger. "A Quantitative Theory of Decision," Psychological Review, (1943).
An early effort to develop a mathematical theory of decision which combines a topological analysis with a vectorial analysis of decision situations. DT

Catanese, Anthony J., "Regional Development Alternatives: A Critique of New Towns," Proceedings of the Midwest Students Seminar on Urban and Regional Research. Edited by Alan Walter Steiss. Madison: University of Wisconsin, (1967).
An examination of the problems of the "New Town Approach" to regional planning using Set Theory as an organizational basis. SA

Charnes, A., and W. W. Cooper. Management Models and Industrial Applications of Linear Programming: Volume I. New York: John Wiley & Sons, 1961.
One of a few works dealing with applications of Linear Programming written by two of the pioneers of the technique. SA

Churchman, Charles W., Ackoff, Russell, and E. Leonard Arnoff. Introduction to Operations Research. New York: John Wiley & Sons, 1957.
A general introduction to methods concerning inventories, linear programming, queuing theory, replacement models, and so forth with an emphasis on the application of operations research to industrial problems. SA

Clarke, Roderick W. An Introduction to Critical Path Analysis. Stanford: Stanford University Press, 1961.
One of the earliest intensive treatments of the subject but still useful for a basic understanding of the technique. WP

Clarkson, Geoffrey P., and Allan H. Meltzer. "Portfolio Selection: A Heuristic Approach," Journal of Finance, (December, 1960).
One of several studies developed to simulate the existing decision-making activities of an individual; in this case, a heuristic approach is applied to the investment of trust funds held by banks. DT

Clawson, Marion, and Jack L. Knetsch. Economics of Outdoor Recreation. Baltimore: John Hopkins Press, 1966.
The finest work in the area of quantified analysis of outdoor recreation demand and supply. A useful planning book. SA

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Clawson, Marion. Methods of Measuring the Demand and Value of Outdoor Recreation. Washington: Resources for the Future, 1959.
One of the best and perhaps only successful attempt to quantify variables for the measurement of outdoor recreation demand. SA

Collins, Frank Thomas. Manual Critical Path Techniques for Construction. Berkeley: Know How Publications, 1965.
Non-computerized techniques for using CPM with special attention being paid to building and construction. WP

_____. Network Planning and Critical Path Programming. Berkeley: Know How Publications, 1964.
A less technical and simplified approach making ample use of humorous cartoons and anecdotes. WP

"Critical Path Programming: The New Way To Take the Guesswork Out of Scheduling," House and Home, (April, 1963).
An application for small home and apartment builders. A very interesting treatment in a limited space. WP

Cyert, Richard, Simon, Herbert A., and Donald Trow. "Observation of a Business Decision," Journal of Business, (1956).
This study presents an empirically derived model of the decision-making process in administration which illustrates some of the applications of heuristics. DT

Deatherage, George E. Construction Scheduling and Control. New York: McGraw-Hill, 1965.
Several parts of the book give applications of the PERT-CPM techniques in construction. WP

Deutsch, Karl W. "Game Theory and Politics: Some Problems of Application," Canadian Journal of Economic and Political Science, (1954).
An exploration of some of the limitations of game theory as it is applied in political problem-solving situations. The author asserts that insufficient consideration is given to dynamic factors and to value judgments. DT

_____. The Nerves of Government. New York: The Free Press of Glencoe, 1963.
An examination of Cybernetic theory as it might be applied in the development of models for political communication and control. Emphasis is given to the role of learning, memory, feedback, and the establishment of goals and purposes. CY

Dooley, Arch R., et. al., Operations Planning and Control. New York: John Wiley, 1964.
A casebook of planning problems prepared for use in the Graduate School of Business, Harvard University. Part 2 is concerned with the use of CPM techniques for operations. DT

Dreyfus, Hubert L., "Alchemy and Artificial Intelligence," The RAND Corporation, Vol. P-3244 (December, 1965).

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This work suggests some of the limitations to the use of heuristic programming in cognitive simulations. It is suggested that the best that can be achieved through research in artificial intelligence is computer approximation of decision-making through discrete operations. DT

Drucker, Peter F. The Practice of Management. New York: Harper & Brothers, 1954.
This book includes a highly developed analysis of the process of making decisions including the problem definition stage, the alternative development stage, and the action program stage. The author considers that the field of operations research is concerned with information processing rather than decision-making. DT

_____. "The Effective Decision," Harvard Business Review, (January-February, 1967).
A concise presentation of the author's further thinking on the procedures of decision-making. Particular emphasis is given to the distinction between generic and unique problem situations. DT

Duke, Richard D. Gaming Simulation in Urban Research. East Lansing: Michigan State University, Institute for Community Development, 1964.
An extensive review and discussion of application of gaming techniques in urban areas. Included is a basic bibliography on gaming and simulation models. DT

Easton, David A. A System Analysis of Political Life. New York: John Wiley, 1965.
The second in a trilogy in which the author attempts to develop a general theory for political analysis. The framework presented draws heavily from Systems Analysis and includes a General Cybernetic Model for public decision-making processes. SA

Evarts, Harry F. Introduction to PERT. Boston: Arlyn and Bacon, 1964.
A good treatment of the subject. The book is part of a series on quantitative methods for business and economics. WP

Federal Electric Corporation. A Programmed Introduction to PERT. New York: John Wiley, 1964.
A textbook which employs the new "programmed instruction" approach, which allows for either self-teaching or computerized teaching. The treatment is highly technical, however, and does not go into depth on applications of the technique. WP

Flagle, Charles D., Higgins, William H., and Robert H. Roy. Operations Research and Systems Engineering. Baltimore: John Hopkins Press, 1960.
A collection of papers originally presented as lectures in a course of the same title at the John Hopkins University. The work is distinguished by its succinct treatment of a large scope of subject matter. SA

Gore, William J. Administrative Decision-making: A Heuristic Model. New York: John Wiley, 1964.

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An elaborate examination of the processes by which adaptive decisions are made through the use of heuristics or decision rules. Adaptive decisions are those for which there is a general agreement on goals and acceptance of a pattern of activities appropriate to achieving them. DT

Guetzkow, Harold. Simulation in Social Science. Englewood Cliffs: Prentice-Hall, 1962.
A discussion of the possible applications of simulation techniques in social science research. Simulation models are viewed as a set of criteria for selecting significant data and provide rules for applying logic to the distilled information. SA

Hadley, G. Nonlinear and Dynamic Programming. Reading: Addison-Wesley, 1964.
The basic textbook on nonlinear and dynamic programming, although it is not written for those with only a passing acquaintance with mathematics--strictly for the specialist. SA

Hansen, B. J. Practical PERT Including CPM. Washington: America House, 1964.
As the title implies, this treatment attempts to strip the intricacies of theory and mathematics away so as to allow for application. WP

Harris, Britton. "Urban Development Models: New Tools for Planning," Journal of the American Institute of Planners, (May, 1965).
The author attempts to suggest how simulation models can be applied as a means of calculating the optimal solution and evaluating alternative development strategies in urban planning. SA

Hart, William J. A Systems Approach to Park Planning. Marges, Switzerland: International Union for the Conservation of Nature and Natural Resources, 1966.
An unusual book and source, but a very lucid and innovative general discussion of the possible areas of application of the system approach. SA

Hatry, Harry P., and John F. Cotton. Program Planning for State, County, City. Washington: The George Washington University, 1967.
The most important report to come out of the so-called "5-5-5- Project" at George Washington University on planning-programming-budgeting-systems (P.P.B.S.). SA

Herrmann, Cyril C. "Systems Approach to City Planning," Harvard Business Review, (September-October, 1966).
A discussion of the applications made of Systems Analysis techniques to urban renewal and redevelopment programs in the city of San Francisco. SA

Hill, D. M., Brand, D., and W. B. Hansen. "Prototype Development of a Statistical Land Use Prediction Model for the Greater Boston Region," Highway Research Board Record, No. 114. Washington: Highway Research Board, 1966.
A preliminary discussion of the principles of the EMPIRIC Model which is informative for specialists. SA

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Hitch, Charles J. Decision Making for Defense. Berkeley: University of California, 1966.
One of the best discussions of Systems Analysis as applied in the United States Department of Defense. Traces through the development of the systems approach of planning, programming, budgeting procedures (P.P.B.S.) formulated under the tutelage of Robert McNamara. DT

Hurwicz, Leonid. "Game Theory and Decisions," Scientific American, (February, 1955).
A non-technical explanation of game theory, illustrated by simple mathematical problems. DT

Kilbridge, Maurice, and Leon Wester. "A Heuristic Method of Assembly Line Balancing," Journal of Industrial Engineering, (July-August, 1961).
This study discusses the application of heuristic programming techniques to a production management problem of assigning elemental assembly tasks to work stations along a conveyor line; the problem of minimizing idle time among operators is analogous to the problem of "leveling-off" staff commitments. WP

Krasnow, H. S., and R. Merikallio. "The Past, Present, and Future of General Simulation Languages," Management Science, (November, 1964).
This work explores the possibility of an all-purpose simulation language which would greatly reduce programming efforts and increase flexibility in the application of simulation techniques. SA

Lasswell, Harold D. The Decision Process: Seven Categories of Functional Analysis. College Park: University of Maryland, Bureau of Governmental Research, 1956.
Develops seven categories of functional analysis--intelligence, recommendation, prescription, invocation, application, appraisal, and termination--and investigates each area in relation to the particular branch of government with which it is concerned. DT

Levin, Richard I., and Charles A. Kirkpatrick. Planning and Control with PERT/CPM. New York: McGraw-Hill, 1966.
A recent work on the subject which places the technique within a very interesting framework of planning as a generic process. WP

Lockyer, K. G. An Introduction to Critical Path Analysis. New York: Pitman Publishing Co., 1964.
An adequate treatment of the subject matter which will enable a general understanding. WP

Lowe, Cecil William. Critical Path Analysis by Bar Chart: The Role of Job Progress Charts. London: Business Publications, 1966.
The author argues that small and medium-sized programs do not require computerization. He develops a technique which incorporates the Gantt Chart into the CPM approach for on-going control of programs. WP.

Lowry, Ira S. "A Short Course in Model Design," Journal of the American Institute of Planners, (May, 1965).

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A succinct review of theories and uses of descriptive, predictive, and mathematical models. Extensive bibliography of model applications in the field of planning. SA

Luce, R. Duncan, and Howard Raiffa. Games and Decisions: Introduction and Critical Survey. New York: John Wiley, 1957.
This work attempts to communicate the central ideas and results of game theory and related decision-making models unencumbered by their technical mathematical detail. Examples are drawn from the social sciences with an emphasis on application and theoretical concepts. DT

McCamy, J. L. "Analysis of the Process of Decision-Making," Public Administration Review, (1947).
A basic discussion of decision-making as the center of the process of administration is presented from the point of view of a political scientist. DT

McKean, Roland N. Efficiency in Government Through Systems Analysis. New York: John Wiley, 1957).
An early discussion of potertial transfers of systems techniques for defense applications to non-defense governmental functions. A case study of water resource management is included. SA

Meier, Richard L. A Communications Theory of Urban Growth, Massachusetts: Cambridge, M.I.T. Press, 1962.
A pioneering effort in the application of communications theory as a tool of analysis and prediction with regards to the patterns of urban growth. This study explores some of the long-range possibilities for the application of simulation procedures as a means of synthesis for complex problems. SA

_____. Developmental Planning. New York: McGraw-Hill, 1965.
A study of planned regional development for Puerto Rico, this report discusses the application of various techniques for simulation and guidance in the field of planning. SA

Meier, Richard L., and Richard D. Duke. "Gaming Simulation for Urban Planning," Journal of the American Institute of Planners, (January, 1966).
The authors present an extensive survey of the applications of gaming simulation techniques in the field of planning. They conclude with a presentation of a "hybrid" model, which they suggest will achieve the most thorough compression of the real world, while still retaining the flexibility for exploring widely divergent futures. DT

Miller, Robert W. Schedule, Cost and Profit Control with PERT. New York: McGraw-Hill, 1963.
A guide for use of the technique in programs where cost and profit hold special significance to the manner in which jobs are undertaken. WP

Moder, Joseph J., and Cecil R. Phillips. Project Management with PERT and CPM. New York: Reinhold, 1964.
The concern here is with short-term, complex problems and how they can be resolved by using the techniques of PERT and CPM. WP

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Novick, David. Program Budgeting. Washington: The Rand Corporation, 1965.
A very good book of readings on the nature and principles of program budgeting in the federal government. SA

O'Brien, James J. CPM in Construction Management: Scheduling by the Critical Path Method. New York: McGraw-Hill, 1965.
Another treatment of CPM in the building and construction context, but with some interesting discussion of managerial utility of the approach. WP

Operations Research, Inc. Manual of Critical Path Theory and Practice. Silver Spring: Operations Research, Inc., 1962.
An early manual which serves as a textbook for three-day short courses on the subject which the firm contracts to present from time-to-time. WP

Optner, Stanford L. Systems Analysis for Business Management. Englewood Cliffs: Prentice-Hall, 1960.
A pioneering treatment of the systems approach for the management of private organizations. Emphasis is on EDP systems. SA

_____. Systems Analysis for Business and Industrial Problem-solving. Englewood Cliffs: Prentice-Hall, 1965.
A refinement, as well as generalization, of Optner's first book. The EDP orientation is replaced by a general systems perspective of more interest to public organizations. SA

Orcutt, G. H., Greenberger, M., Korbel, J., and A. M. Rivlin. Microanalysis of Socio-Economic Systems--A Simulation Study. New York: Harper & Brothers, 1961.
The most important large scale simulation in the social sciences to date. A worthwhile book on this important experiment. SA

Polya, Gyorgy. How To Solve It. New York: Doubleday and Company, Inc., 1957.
This study offers a further discussion of the philosophical basis of heuristic problem solving and its applications within the field of logic. SA

Riggs, James L., and Charles O. Health. Guide to Cost Reduction Through Critical Path Scheduling. Englewood Cliffs: Prentice-Hall, 1966.
A modification of the basic technique to include: (1) a matrix formulation of problem, (2) a probability basis for time estimates, and (3) an improved communication of findings. A very advanced and sophisticated treatment. WP

Schlaifer, Robert. Statistics for Business Decisions. New York: McGraw-Hill, 1961.
This book offers an excellent summary of statistical decision theory, linear programming, and machine problem-solving, translating theory into useful propositions. SA

Shaffer, Louis R., Ritter, J. B., and W. L. Meyer. The Critical Path Method. New York: McGraw-Hill, 1965.
An adequate treatment of the subject which is well-written and illustrated. WP

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Sieloff, Richard O. The Economics of Outdoor Recreation in the Upper Midwest. Duluth: University of Minnesota, 1963.
An interesting attempt at quantification and analytical solution of outdoor recreation needs. SA

Simon, Herbert A., and Allen Newell. "Heuristic Problem Solving: The Next Advance in Operations Research," Operations Research, (January-February, 1958).
This article offers a good introduction to the concepts of heuristic programming and its potentialities for solving ill-structured problems through computer simulation. DT

Smith, Kenneth M. A Practical Guide to Network Planning. London: British Institute of Management, 1965.
A succinct discussion of network planning written from the perspective of the British railroad system. WP

Stires, David M., and Maurice M. Murphy. Modern Management Method: PERT and CPM. Boston: Materials Management Institute, 1962.
A guide prepared for the Corporation for Economic and Industrial Research (CEIR) for three-day short courses. WP

Stires, David M., and Raymond P. Wenig. PERT/COST. Boston: Industrial Education Institute, 1964.
A modification of the basic programming techniques to include cost reduction objectives. The manual was prepared for contractors to the Department of Defense and National Aeronautic and Space Administration who are required to perform such analysis of their programs. WP

Shubik, Martin. Readings in Game Theory and Political Behavior. New York: Doubleday, 1954.
A collection of readings on the application of game theory in the context of political and social science, this book includes a selected bibliography of writings in game theory. DT

Thompson, Victor A. Modern Organizations. New York: Alfred Knopf, 1962.
This work marks the emergence in the literature on organization and theory of a recognition of heuristic processes as being of equal importance to the more formal aspects of the decision system. DT

Traffic Research Corporation. Final Report: Development and Calibration of the EMPIRIC Land Use Forecasting Model for 626 Traffic Zones. Boston: Traffic Research Corporation, 1967.
The definitive work on the development of a land use model which is operational (perhaps the only major land use model to be made operational so far). SA

U. S. National Aeronautic and Space Administration. PERT 'C' Computer Systems Manual. Washington: U. S. Government Printing Office, 1964.
The basic operational guide which N.A.S.A. introduced for computerized scheduling and network planning. WP

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Van Kruegal, E. "Introduction to CPM," Architectural Record, (September, 1964).
A brief description and application to architectural practice and building supervision. WP

Waldron, James A. Applied Principles of Project Management and Control.
Haddonfield: Privately printed by author, 1966.
The author is a planning consultant who published this work to introduce organizations to the benefits of CPM as part of a general management control system. WP

Wiener, Norbert. Cybernetics: or Control and Communication in Animal and the Machine. New York: John Wiley, 1948.
The author presents the concept of Cybernetics as a new field of control and communication based on statistical mechanics. Statistical methods and quantum mechanics are discussed as they can be applied to the problem of predicting the future of a system. CY

Wiener, Norbert. The Human Use of Human Beings: Cybernetics and Society.
Boston: Houghton Mifflin, 1954.
The theories of Wiener's earlier book are restated in non-mathematical terms, and the ethical and social implications are examined. The implications of Cybernetics are explored in a wide range of human endeavours. CY

Wiest, Jerome D. "Heuristic Programs for Decision-Making," Harvard Business Review, (September-October, 1966).
This article provides an extensive review of various applications of heuristic programming in the field of business, including location allocations, site selection, job shop scheduling, engineering design, and large project scheduling where such planning and scheduling techniques as PERT and CPM are widely used. DT

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